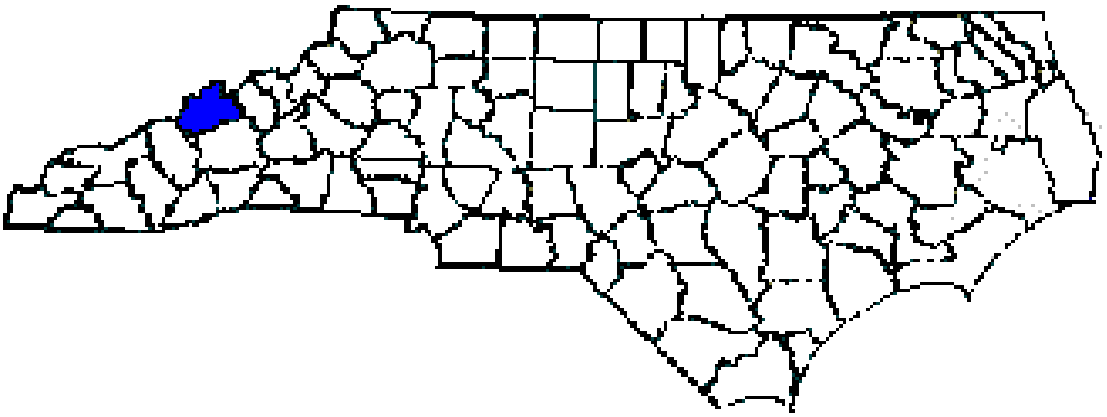
ANNUAL REPORT FOR 2015



Bailey Branch Site D Mitigation Site
Madison County
TIP No. R-2518A
COE Action ID: SAW-2007-2197-357/300
DWR #: 20071134

Prepared By:
Natural Environment Section & Roadside Environmental Unit
North Carolina Department of Transportation
November 2015

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SUMMARY

The following report summarizes the stream monitoring activities that have occurred during the Year 2015 at the Bailey Branch Site D Mitigation Site in Madison County. The North Carolina Department of Transportation (NCDOT) completed this project and water was turned in November 2008. This report provides the monitoring results for the sixth formal year of monitoring (Year 2015). The Year 2015 monitoring period was the sixth of five scheduled years of monitoring on the Bailey Branch Site D Mitigation Site (See Success Criteria Section 2.1).

It was agreed by the Regulatory Agencies and NCDOT during the March 18, 2015 Annual Monitoring Meeting that all stream surveying could be discontinued. NCDOT visually inspected the 82 linear feet of stream restoration/relocation within NCDOT's right-of-way at Site D. NCDOT will not be receiving any credit for the 180 linear feet of stream restoration/relocation that is located within the Permanent Drainage Easement (PDE) at Site D. Site D will continue to be visually inspected and photographed for channel stability and planted vegetation survival.

Based on the overall conclusions of monitoring at the Bailey Branch Site D, it has met the required monitoring protocols for the sixth formal year of monitoring on the stream and fourth formal year of monitoring on the planted vegetation. The channel throughout the stream restoration/relocation site is stable at this time. The streambank and buffer area were planted in March 2012 with live stakes and bareroot seedlings. The planted vegetation is surviving at this time.

NCDOT proposes to continue visual stream and vegetation monitoring at the Bailey Branch Site D Mitigation Site in 2016.

1.0 INTRODUCTION

1.1 Project Description

The following report summarizes the stream monitoring activities that have occurred during the Year 2015 at the Bailey Branch Site D Mitigation Site. Site D is located on US 19 in Madison County at Sta. 31+20 Rt. and Sta. 31+60 Lt. –L- (Figure 1). The Bailey Branch Site D was constructed to provide mitigation for stream impacts associated with Transportation Improvement Program (TIP) number R-2518A in Madison County.

The mitigation site provided approximately 82 linear feet of stream restoration/relocation. Construction was completed and water was turned in November 2008 by the NCDOT. Stream restoration/relocation involved installing several in-stream cross vane structures and planting the riparian buffer zone.

1.2 Purpose

In order for a mitigation site to be considered successful, the site must meet the success criteria. This report details the monitoring in 2015 at the Bailey Branch Site D Mitigation Site. Hydrologic monitoring was not required for this site.

1.3 Project History

November 2008	Construction Completed
November 2008	Water Turned Into Stream
March 2009	Site Planted (Type I only)
October 2009	As-Built Survey Completed
November 2010	Stream Channel Monitoring (Year 1)
November 2011	Stream Channel Monitoring (Year 2)
March 2012	Site Planted (Type I and II)
September 2012	Vegetation Monitoring (Year 1)
November 2012	Stream Channel Monitoring (Year 3)
February 2013	Planted Contractors Staging Area
March 2013	Bankfull Monitoring Gauge Installed
August 2013	Vegetation Monitoring (Year 2)
November 2013	Stream Channel Monitoring (Year 4)
July 2014	Vegetation Monitoring (Year 3)
November 2014	Stream Channel Monitoring (Year 5)
July 2015	Vegetation Monitoring (Year 4)
November 2015	Visual Stream Channel Monitoring (Year 6)

1.4 Debit Ledger

The entire 82 linear feet of Bailey Branch Site D stream mitigation site located within NCDOT's right-of-way was used for the R-2518A project to compensate for unavoidable stream impacts.

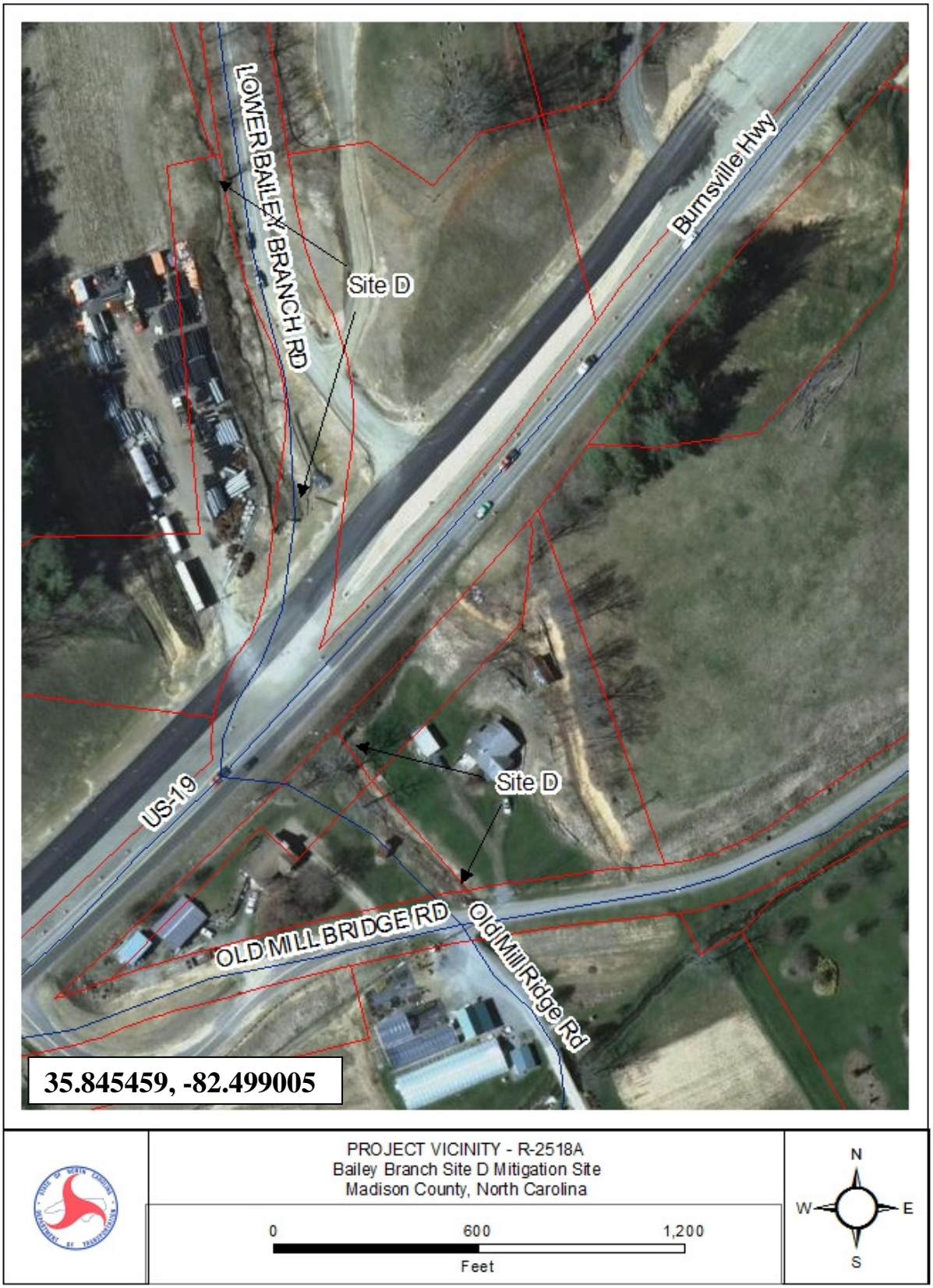


Figure 1. Vicinity Map

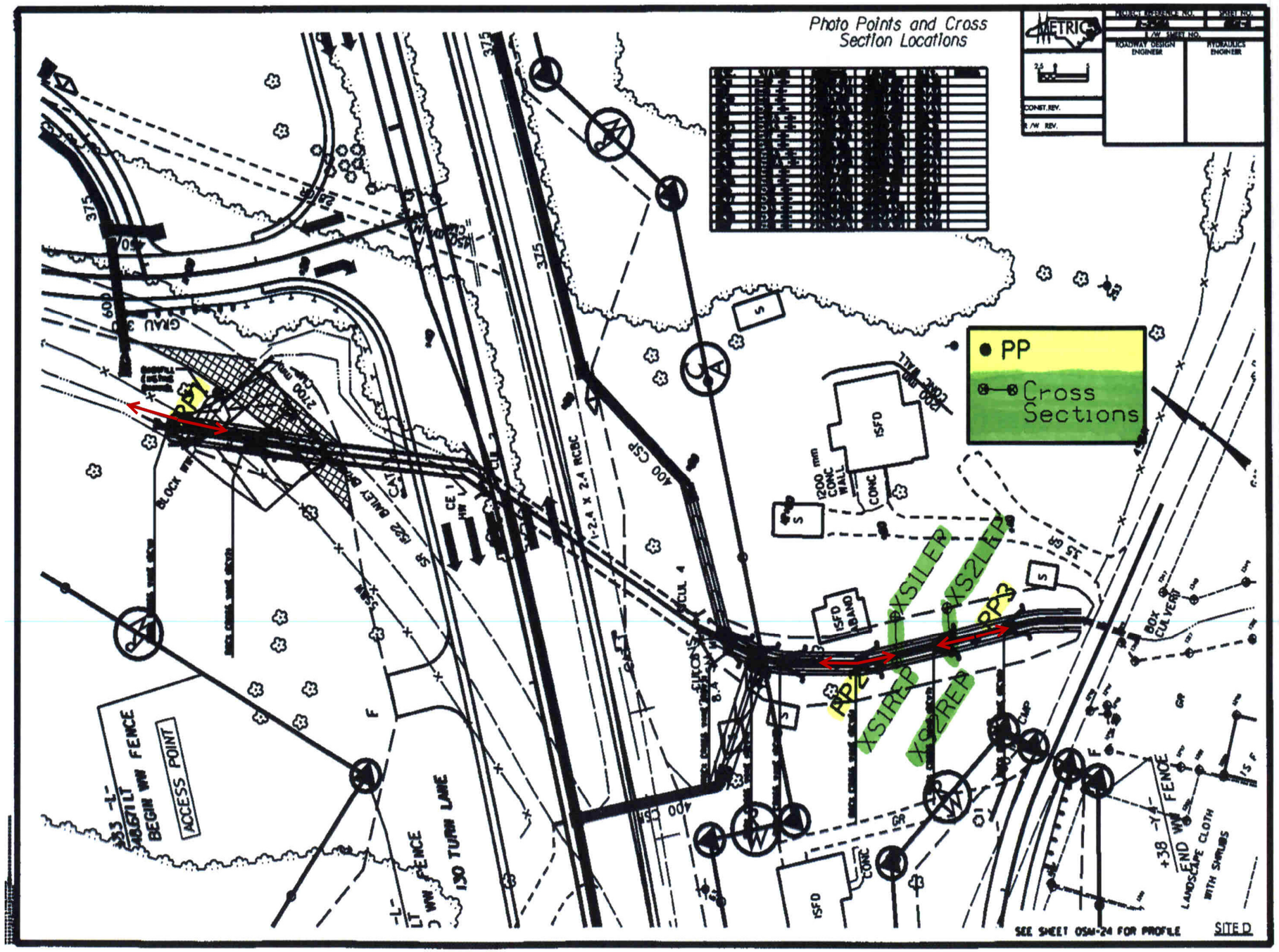
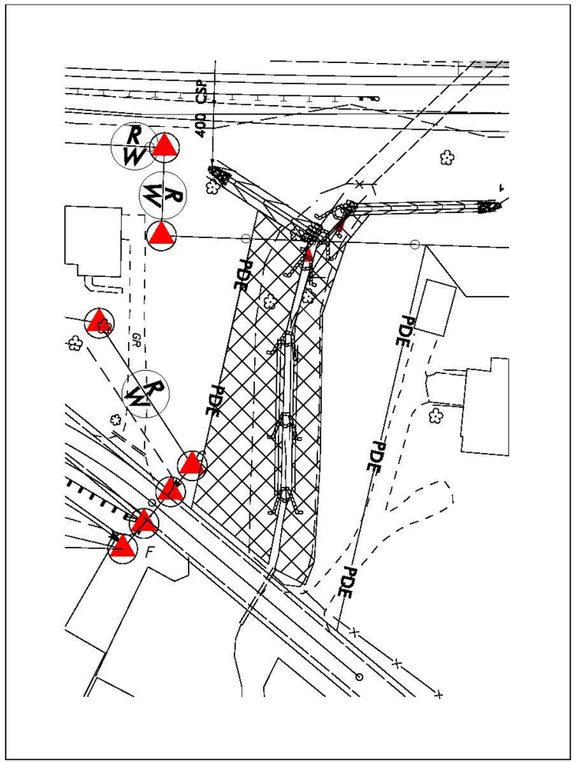


Figure 2. Site D Map

METRIC	PROJECT REFERENCE NO.	SHEET NO.
	R-2518A	RF-6
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STREAMBANK REFORESTATION FOR SITE D (LOWER)



STREAMBANK REFORESTATION FOR SITE D (UPPER)

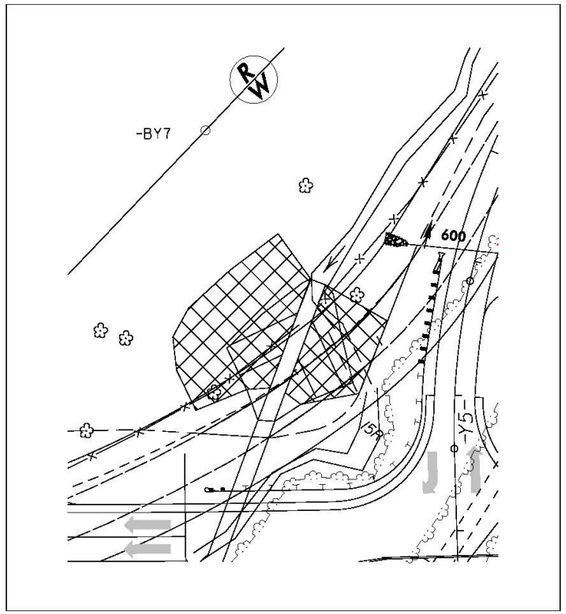


Figure 3. Site D Reforestation Map

2.0 STREAM ASSESSMENT

2.1 Success Criteria

The permittee shall monitor the restoration and enhancement mitigation sites following the Level 1 protocols outlined in the "Stream Mitigation Guidelines," dated April 2003 with the following exceptions:

1. Pebble counts shall not be conducted.

2. Two cross sections shall be conducted for streams less than 500 linear feet and five (5) cross sections shall be conducted for streams greater than 500 linear feet.

3. Riparian success shall be by visual inspection of plant survival. Photos will be taken and comments noted on plant survival.

The permittee shall monitor the preservation sites by visual inspection. Photos will be taken and comments noted on plant survival. The monitoring shall be conducted annually for a minimum of five (5) years after final planting. The monitoring results shall be submitted to DWR in a final report within sixty (60) days after completing monitoring. After 5 years the NCDOT shall contact the DWR to schedule a site visit to "close out" the mitigation site.

2.2 Stream Description

2.2.1 Post-Construction Conditions

The restoration/relocation of the Bailey Branch Site D Mitigation Site involved installing several in-stream cross vane structures and planting the riparian buffer zone.

2.2.2 Monitoring Conditions

The objective of the Bailey Branch Site D stream restoration/relocation was to restore a B4 stream as identified in Rosgen's Applied River Morphology. A total of two cross sections (one in a riffle and one in a pool) were surveyed. For this report, only cross sections containing riffles were used in the comparison of channel morphology. Morphology table comparison can be found in the 2010 to 2012 monitoring reports.

2.3 Results of the Stream Assessment

2.3.1 Site Data

The assessment included the survey of two cross sections and the longitudinal profile of the Bailey Branch Site D established by NCDOT after construction. The length of the profile along the Bailey Branch Site D was approximately 200 linear feet. Two cross sections were established during the as-built monitoring year. Cross section locations were subsequently based on the stationing of the longitudinal profile and are presented below. The location of the cross sections and longitudinal profile are shown in the 2010 to 2012 monitoring reports Appendix A.

Bailey Branch Site D Cross-Sections:

- Cross-Section #1: Bailey Branch Site D, Station 103+00, midpoint of riffle
- Cross-Section #2: Bailey Branch Site D, Station 130+00, midpoint of pool

It was agreed by the Regulatory Agencies and NCDOT during the March 18, 2015 Annual Monitoring Meeting that all stream surveying could be discontinued. NCDOT visually inspected the 82 linear feet of stream restoration/relocation within NCDOT's right-of-way. NCDOT will not be receiving any credit for the 180 linear feet of stream restoration/relocation that is located within the in Permanent Drainage Easement (PDE).

Site D was visually inspected and photographed for channel stability and planted vegetation survival. Based on the 2015 visual inspection of the stream, the channel and its streambanks are stable at this time. Four bankfull events were documented by a surface water gauge at Site D for the 2013 and 2014 monitoring years.

3.0 VEGETATION: BAILEY BRANCH SITE D

3.1 Description of Species

The following tree species were planted on the streambank:

Salix nigra, Black Willow

Cornus amomum, Silky Dogwood

The following tree species were planted in the buffer area:

Liriodendron tulipifera, Yellow Poplar

Platanus occidentalis, Sycamore

Fraxinus pennsylvanica, Green Ash

Quercus alba, White Oak

3.2 Results of Vegetation Monitoring

Streambank & Buffer Vegetation: The streambank reforestation was completed in March 2012. The Year 4 vegetation monitoring evaluation noted: Type I: Black Willow, Silky Dogwood and Type II: Sycamore, Green Ash, and White Oak were surviving at the time of the monitoring evaluation.

3.3 Conclusions

NCDOT will continue to monitor the planted vegetation in 2016.

4.0 OVERALL CONCLUSIONS/RECOMMENDATIONS

The Bailey Branch Site D Mitigation Site has met the required monitoring protocols for the sixth formal year of monitoring on the stream and the fourth formal year of monitoring on the planted vegetation. The channel throughout the stream restoration/relocation site is stable and the planted vegetation is surviving at this time.

NCDOT proposes to continue visual stream and vegetation monitoring at the Bailey Branch Site D Mitigation Site in 2016.

5.0 REFERENCES

Stream Mitigation Plan, US Highway 19, R-2518A On-Site Mitigation Madison County, North Carolina, August 2006.

Design Plans for R-2518A, US 19 from I-26 to 0.8 KM east of the Yancey Co. Line, Stream Mitigation (Preservation, Enhancement, and Restoration), HSMM.

North Carolina Department of Transportation (NCDOT), April 29, 2008. 404 and 401 Individual Permits for R-2518A and R-2518B (ACOE Permit No. 2007-2197-357/300 and DWR Project No. 20071134, Individual Certification No. 3706).

Rosgen, D.L, 1996. Applied River Morphology. Wildland Hydrology, Pagosa Springs, Colorado.

US Army Corps of Engineers (USACE), 2003. Stream Mitigation Guidelines. Prepared with cooperation from the US Environmental Protection Agency, NC Wildlife Resources Commission, and the NC Division of Water Resources.

APPENDIX A

SITE PHOTOGRAPHS

Bailey Branch Site D

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